Floodplain Meadow Restoration Case Study
Langley's Lane Meadow, Oxfordshire
River Thames Field 2

Landownership and site background

This field is owned and managed by a private landowner. However the site forms part of a wider network of land managed by the Lower Windrush Valley Project. This area is now managed as a nature reserve known as Standlake Common. Section 106 agreements were established in 1990's when gravel pits were dug to create and fund this reserve. All the fields including those outside the reserve are considered in terms of management and are all managed consistently. A management plan is agreed between the LWVP and the landowner in order to ensure that the Nature Reserve is maintained and developed in line with the A. 106 agreements.

This field was in an agri environment scheme between 2012 and 2022 for restoration of species rich semi natural grassland.

Before restoration this field had been managed as a meadow for a few years, but was probably only grazed before 2009.

The fields to the north-east are SSSI meadows.

Restoration activity

Green hay was spread right down to the lake, taken from the adjacent SSSI. The area may have been scarified in advance. There was lots of thistle to start off with and it was scythed in July (2013?). It is understood that the edge of the lake was re-profiled/scraped after gravel extraction ceased.

Current management

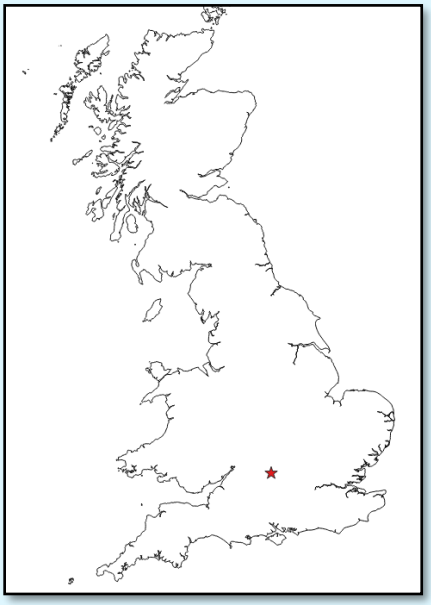
Current management is an annual hay cut followed by after math grazing.
The hay is usually cut mid-late July, although it varies slightly depending on the weather.

Before 2020, sheep were typically on site between October and November. Since 2020, cattle have been used for aftermath grazing instead of sheep and new fencing has been installed.

The management plan outlines the need for continuity with the annual hay cut and aftermath grazing.

Site information

Size: 6.8 ha
Public access: in parts
Phosphorus levels:
Soil type and profile: Sandy clay with sand and gravel at 60 cm
Flood frequency: Annual
Cost: ?
Economics of management:
End use of hay:



Progress by 2023*

When FMP first visited in 2015, the vegetation was much more indicative of wasteland or previously arable land although the back edge of the field looked much more meadow-like with plantain *Plantago lanceolata*, yellow rattle *Rhinanthus minor*, oxeye daisy *leucanthemum vulgare*, black medick *Medicago lupulina* and some great burnet *Sanguisorba officinalis*.

The FMP visited again in 2017 and 2021 and collected quadrat data. Analysis of these data is in Table 1. Soil profiles were also recorded.

* A summary of the data collection and analysis methods used is available here

Progress by 2023 continued

By the visit in 2017, this field appeared to be moving towards MG4b – the Typical sub-community of MG4 *Alopecurus pratensis-Sanguisorba officinalis* meadow. Common knapweed *Centaurea nigra* was widely distributed, and red clover *Trifolium pratense* also had a high cover (up to 70%). High cover of red clover can be associated with a lot of bare ground as it is a poor competitor in a more closed sward and so tends to do well early on in restoration projects.

Grasses on this field are only in occasional patches or thinly spread among the herbs. Cowslip *Primula veris*, ox eye daisy *Leucanthemum vulgare* and self-heal *Prunella vulgaris* were present but only occasionally. Meadowsweet *Filipendula ulmaria*, crested dog's tail *Cynosurus cristatus*, ladies bedstraw *Galium verum*, goat's-beard *Tragopogon pratensis*, and pepper saxifrage *Silaum silaus* have not germinated on this restoration site although they are well represented on the donor site.

The species number per 1 x 1 m quadrat varied from 13 to 21,with 17 species on average. Ellenberg scores indicating moisture (F) and nutrient (N) availability in the soil were relatively low on this field.

Findings 2021

By 2021, the vegetation had moved further towards MG4b – typical MG4 plant subcommunity. However, the vegetation (based on Ellenberg indicator scores) showed that the field has also become wetter and more fertile, and is also similar to the MG4c sub community which is a wetter subcommunity of MG4. The species richness hasn't changed.

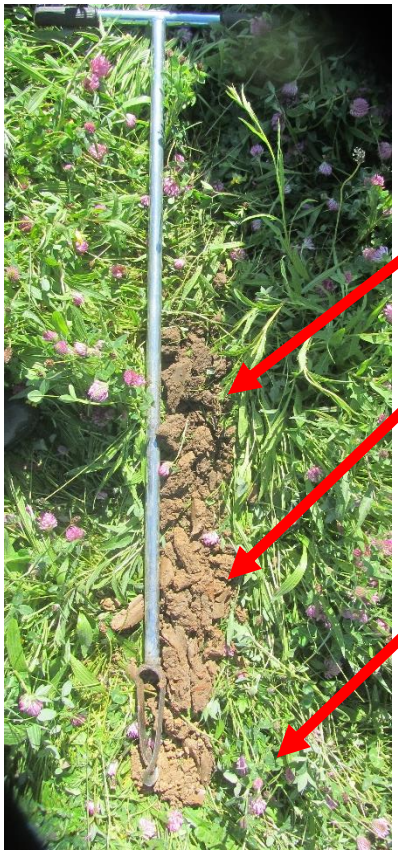
The functional diversity has improved through the reduction of ruderal species in the sward, however tall fescue *Festuca arundinaceae* and perennial rye-grass *Lolium perenne* substantially increased their presence in this field, which was much less grassy in 2017.

Common knapweed was as widely distributed as it was in 2017, whilst red clover largely reduced its cover as the perennial grasses have spread. Species like great burnet *Sanguisorba officinalis*, selfheal and ox-eye daisy were found on the botanical quadrats but in small numbers. Crested dog's tail grass, ladies bedstraw and meadowsweet, which were not recorded in 2017, were found in the quadrats in the 2021 survey.

Although not recorded in the quadrats, it was also noted by the Reserve Manager that cowslips have spread in the sward in this field.

Table 1 Summary of the botanical data collected in 2017 and 2021*

	2017	2021
Ellenberg F (moisture tolerance)	5	5.54
Ellenberg N (fertility)	5.1	5.36
Ellenberg R (Reaction)	6.54	6.34
Species/quadrat (mean and range /1 m x 1 m)	17 (13-21)	17 (14-21)
NVC (top 2 MAVIS subcommunities)	MG4b	MG4c MG4c



A-Horizon
0-20 cm – top soil silty loam

B-Horizon
20-45 cm – sandy clay with some iron and inclusion of gravel
45 cm – manganese nodules and very little gley

C-Horizon
45-60 cm – sand and gravel with a little bit of clay

* **A summary of the data collection and analysis methods used is available here**

Table 2. Restoration progress*
Yellow highlighted figures show where Langley's Lane Meadow Field 2 is on the scale of restoration progress.

Field 1	Progress score 2021				
Measure	1 Poor progress	2	3	4	5 very good progress
Average scores from five botanical quadrats per field. Calculated in MAVIS					
Species richness	<8	8 to 12	13-15	16-20	>20
NVC similarity score	<50%	50-55%	55-60%	>60%	>60%
C:S ratio	1.65	1.39	1.23	1.1	1.09
S:R ratio	0.67	0.79	0.81	0.89	0.93

Management recommendations

This field has well-structured light soils, with a gravel layer at 45 cm. This provides good site drainage and a very good opportunity for species-rich meadow vegetation to establish. The relatively low nutrient level has created favourable conditions for herbs to establish and prevent excessive grass growth. However there are some key species that have not established in the sward so it might be worth considering plug planting species such as great burnet whilst the sward remains open. This species can struggle to compete against a more dense sward.

By 2021, the positive progress made has been slightly slowed by the recent extensive floods which bring nutrient-rich sediments. Nutrient balance in the soil is key to successful restoration and management of the site as species-rich meadow. A double hay cut (early June and early September) is recommended for years with winter floods, or once a year hay cut in mid-late June if two cuts are not possible. This approach to hay cutting helps to remove the excess nutrients, giving less competitive species a chance to spread and forming more diverse plant communities.

It is also recommended to continue with occasional monitoring, repeating these quadrats if possible every 2-3 years.

This field has every potential to accommodate a wider range of species and we would fully expect it to continue to develop diversity.

* A summary of the data collection and analysis methods used is available here